REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

Claims 1-22 were pending in this application. In this Amendment, claim 1 has been canceled. Claims 2, 5-12, 15, and 20-22 have been amended. No new subject matter has been added. Accordingly, claims 2-22 will be pending upon entry of this Amendment.

In the Office Action, a new title that is clearly indicative of the invention was required. Claims 5, 6, 11, and 15 were objected to due to informalities. Claims 1-8 and 12-22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No. 08-032978 to Haga ("Haga") in view of U.S. Patent No. 7,046, 288 to Finlayson ("Finlayson"). Claims 9-11 were objected to as being dependent from a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Objection To Title

The title to the application has been amended as shown herein to clearly indicate the invention.

Objections To Claim Informalities

Claims 5, 6, 11, and 15 have been amended according to the Examiner's suggestion to address the cited informalities. Claim 5 has additionally been amended to recite dependence from claim 2.

Allowable Claims

The Examiner is thanked for the indication of allowable subject matter. In this Amendment, claims 9, 10, and 11 have each been amended in independent form to recite all the limitations formerly recited in canceled base claim 1. Accordingly, each of claims 9, 10, and 11 should be allowable upon entry of this amendment.

Rejection Of Claims 1-8 And 12-22

Claim 1 has been canceled. Regarding the remaining independent claims 2, 7, 8, 12, and 20-22, Haga in view of Finlayson fails to teach the complete combination of elements recited in each respective claim, as currently amended.

To support the rejection of each of the independent claims 2, 7, 8, 12, and 20-22, the Examiner asserts that Haga teaches the feature wherein an objective lens is adapted to receive imaging lights from each of a plurality of subject surface segments located at different depths from said photosensitive surface and form an image on said photosensitive surface using chromatic aberration, each of the imaging lights having wavelength identical to one of said different wavelengths and being different from each other. However, for the reasons set forth below, Haga fails to teach this feature.

The present invention relates to the use of chromatic aberration to achieve a large depth of field based on a principle of capturing images. Chromatic aberration is very common with lenses used to image light of varying wavelength. Chromatic aberration occurs due to the failure of a lens to focus different colors (different wavelength) to the same point on the optical axis. This is a natural result of the fact that the focal length of the lens varies according to wavelength. This results in loss of sharpness and color of an image. Aberration such as chromatic aberration

is usually the target of avoidance and camera developers try hard to reduce aberration. Rather than avoid chromatic aberration, the present inventions takes advantage of the chromatic aberration of a lens to achieve a large depth of field.

In the present invention, imaging lights chosen from, for example, the red, green and blue portions of the light spectrum, each corresponding to a different respective wavelength, are used to illuminate a sample (see Figures 2-6). As depicted in Figures 3-5, each different light color, when reflected off a fixed surface XR and through an objective lens 133, is focused at a different respective focal plane 134a, which causes chromatic aberration.

In accordance with the present invention, embodiments of the present invention take advantage of the chromatic aberration produced by the lens 133, as depicted, for example, in Figures 2 and 6. Figure 6 illustrates that each of the imaging lights corresponding to red light (LR), green light (LG), and blue light (LB) that are reflected from respective different surface segments (XR, XG and XB) located at different depths of a sample, can be focused through objective lens 133 on the same stationary photosensitive surface 134a (*see, e.g.*, amended claim 2: "said objective lens being adapted to receive imaging lights from each of a plurality of subject surface segments located at different depths from said photosensitive surface and form an image on said photosensitive surface using chromatic aberration, while said photosensitive surface is stationary, each of the imaging lights having wavelength identical to one of said different wavelengths and being different from each other"). The focusing of imaging lights of different color on the same photosensitive surface is accomplished because the surface segments XR, XG, and XB lie at a different depth (*i.e.*, distance) from the photosensitive surface, and therefore a different focal length, corresponding to light of the chosen color.

The recited invention further provides a photosensitive surface that has a plurality of different kinds of elements sensitive to the respective different colors corresponding to imaging light reflected from the sample (*see, e.g.*, amended claim 2: "the photosensitive surface having different kinds of elements arranged in an array that are for generating predetermined signals in response to light in different wavelengths"). For example, as described at page 21, a pickup element sensitive to red takes an image of light reflected from XR surface segment of the sample, a pickup element sensitive to green takes an image of light reflected from XG surface segment of the sample, and a pickup element sensitive to blue takes an image of light reflected from XB surface segment of the sample.

In addition, the recited invention comprises an image processing means that can produce images corresponding to the signals generated from the different elements of the photosensitive surface (*see, e.g.*, amended claim 2: "said image processing means being adapted to generate, according to said signal generated by said different kinds of elements, image data with which the same number of a plurality of images produced by the same kind of said elements are provided as the number of said elements").

In accordance with the present invention, the image processing means can produce, for example, a set of three different images corresponding to a red light image, a green light image, and a blue light image as detected by the photosensitive surface (see Figures 7A and 7B). As shown, the red light image corresponds to imaging light reflected from XR surface segment of object S, the green light image corresponds to imaging light reflected from XG surface segment of object S, and the blue light image corresponds to imaging light reflected from XB surface segment of object S. Thus, images R, G, and B, of Figure 7B give both lateral and depth

information about object S. Alternatively, as depicted in Figure 8, the R, G, and B elements can be combined in a single image. A user viewing such an image, can thereby readily appreciate the depth information of the object S provided in such an image.

Haga falls very far short of disclosing the features recited in claims 2, 7, 8, 12, and 20-22 discussed above. As a first matter, the object of Haga is to obtain a picked up image of high quality with a simple device constitution by *moving an image pickup element* in the optical-axis direction to correct the deviation of the image forming position due to the chromatic aberration on the axis. As shown in Figs. 3 and 5b, the image pickup element 5 of Haga is moved along the optical axis because the image location varies according to the color, due to chromatic aberration. Specifically, in order to form an image from different light colors, the imaging plane of pickup element 5 is moved to intercept the different focal planes formed by red, green and blue light, respectively. Thus, by use of a piezo element to *move* pickup element 5, the camera of Haga *removes* the effect of chromatic aberration at pickup element 5 caused by pickup lens 1 (see Figure 3) that would exist if pickup element 5 remained stationary. This is contrary to the present invention, in which, as described above, the inventive camera and method involves a *stationary* imaging surface that *uses* chromatic aberration of the objective lens to form an image having information corresponding to surface segments of different heights in a sample. Notably, claims 2, 7, 8, 12, and 20-22 have been amended to further highlight this difference between the camera of Haga and aspects of the present invention: "said objective lens being adapted to receive imaging lights from each of a plurality of subject surface segments located at different depths from said photosensitive surface and form an image on said photosensitive surface using chromatic aberration, *while said photosensitive surface is stationary*" (emphasis added).

To support the rejection of claims 2, 7, 8, 12, and 20-22, the Examiner further asserts that Finlayson teaches a photosensitive surface (on CCD 12) having different kinds of elements arranged in an array (sensor array 12) that are for generating predetermined signals in response to light in different wavelengths (col. 6, lines 50-52). However, these teachings of Finlayson fail to cure the deficiencies of Haga with respect to the features recited in independent claims 7, 8, 12, and 20-22. Specifically, Finlayson does not teach or suggest a camera having an objective lens being adapted to receive imaging lights from each of a plurality of subject surface segments located at different depths from said photosensitive surface and form an image on said photosensitive surface using chromatic aberration, while said photosensitive surface is stationary, each of the imaging lights having wavelength identical to one of said different wavelengths and being different from each other.

Accordingly, the cited art falls well short of teaching or suggesting the complete combination of elements recited in claims 2, 7, 8, 12, and 20-22. Claims 2, 7, 8, 12, and 20-22 are therefore patentable over Haga in view of Finlayson. The same applies to dependent claims 3-6 and 13-19, at least due to their dependence from patentable claims.

In view of the foregoing, all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone applicants' undersigned representative at the number listed below.

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Respectfully submitted,

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